Space Weather Forecast

Issued on Monday 13 January 2025 at 13:14 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight Chance of isolated Moderate flares, slowly increasing. Faster solar wind enhancement likely.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low during the last 24 hours with only Common-class flares recorded.

There are seven sunspot regions on the visible disc with AR3958 fading and AR3960 numbered in the southeast. AR3947 remains the most magnetically complex group, the evolution for this region appears steady however, or in slight decline. AR3959 continues to move into view around the northeast limb, with the initial simple classification so far maintained until we see any more evidence of a trailing portion, which could suggest an increased flare risk. Other regions remain smaller and simple with limited overall change.

No Earth-bound CME's (coronal mass ejections) were observed during this period.

Solar Wind / Geomagnetic Activity: Solar winds have erratically risen through the period from 380km/s to 450km/s, with the likely onset of a faster wind stream and potentially some transitory CME influence. The Interplanetary Magnetic Field, Bt, at weak to moderate levels. The north-south component, Bz, varying, with a sustained negative deflection between 12/2200 UTC and 13/0100 UTC. Geomagnetic activity was mainly Quiet (Kp 1-2), with an isolated Active (Kp 4) interval 13/0000-0300UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Generally Low, with a slowly increasing chance of isolated Moderate flares and a very slight chance of isolated Strong flares, mainly due to a moderately large sunspot region located in the northwest disc or any spots that rotate over the eastern limb later in the period.

Solar Wind / Geomagnetic Activity: Solar winds have been slowly rising, with observed speeds now around 440km/s. Speeds most likely remaining at slightly elevated to elevated levels through Day 1 (13 Jan) into Day 2 (14 Jan). There remains a slight chance of a CME arrival early on Day 1,

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but this is highly uncertain. Solar wind speeds expected to gradually decrease back to background from Day 3 (15 Jan).

Geomagnetic activity is expected to be mainly Quiet to Unsettled (Kp1-3) though Days 1-2 (13-14 Jan), but with a chance of Active (Kp4) intervals and a slight chance of isolated G1 to G2 Minor/Moderate Storms should any significant CME influence be forthcoming. Activity is then expected to return to Quiet to Unsettled (Kp1-3) levels from Day 3 (15 Jan) onwards.

Energetic Particles / Solar Radiation: Solar radiation is expected to remain at background levels, with only a slight chance of rising in response to any notable flares.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	**G1 to G2**	No	15	10	5	5
Strong	**G3**	No	1	1	1	1
Severe	**G4**	No	1	1	1	1
Extreme	**G5**	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**R1-R2 (M Class)**	No	20	25	30	35
Very Active	**R3-R5 (X Class)**	No	5	5	10	10

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	5	5	10	10
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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